

**Amendments to the Drawings**

Figures 8a and 8b have been amended to include element 249.

Attachment: Replacement Sheet

Annotated Sheet

**REMARKS**

In response to the Office Action mailed May 31, 2005, Applicants respectfully request reconsideration. Claims 15, 18-22, and 34-36 were previously pending in this application. Claims 18-22 have been withdrawn from consideration. Claims 15 and 34 have been amended. No new claims have been added. As a result, claims 15 and 34-36 are pending for examination with claims 15 and 34 being independent. This application is believed to be in condition for allowance.

**Summary of Embodiments of Applicants' Invention**

An example of one embodiment of Applicants' invention is described below to highlight some aspects of the invention. This embodiment is described primarily in the specification at page 6, line 20 - page 7, line 2; page 15, line 28 - page 16, line 4; page 17, lines 4-28; and page 32, lines 9-13. It should be appreciated that the description below is merely an example of one of many embodiments that fall within the scope of Applicants' claims and is provided merely for the purpose of highlighting some aspects of Applicants' invention.

Inductive sensors are described for the measurement of the near surface properties of conducting and magnetic materials. The sensors use novel winding geometries that promote accurate modeling for the sensor response, provide material characterization, and the detection and monitoring of precrack fatigue damage, as well as detection and monitoring of cracks, and other material degradation from testing or service exposure (page 6, line 20 - page 7, line 2). The sensor comprises of a primary winding and a secondary winding. A current is applied to the primary winding and a voltage is measured at the terminals of the secondary winding (page 15, line 28 - page 16, line 4). Using a grid measurement method, the response of the sensor is converted into material or geometric properties. An advantage of the measurement grid method is that it allows for real-time measurements of the absolute electrical properties of that material.

The sensor is also capable of providing a measure of fatigue damage prior to the formation of cracks detectable by traditional non destructive inspection methods (page 17, lines 4-28). A sensor may also be fabricated with a porous (or liberally perforated) substrate material, to avoid or minimize interference with the environment causing the corrosion process to occur on the surface and to provide continuous monitoring and inspection for stress corrosion cracking or

corrosion fatigue (page 32, lines 9-13). Illustrative perforations are shown in amended Figures 8a and 8b at 249.

It will be understood that a continuous, non-permeable sensor substrate would protect the surface from corrosion, that is, would interfere with the environment causing the corrosion process to occur. A porous or perforated substrate avoids or minimizes that interference, thus allowing corrosion to occur. The sensor is thus able to monitor natural properties with corrosion.

The foregoing summary is provided merely to assist the Examiner in appreciating the various aspects of the present invention. The summary may not apply to each of the independent claims, and the language of the independent claims may differ in material respects from the summary provided. The Examiner is requested to give a careful consideration to the language of each of the independent claims and to address each on its own merits, without relying on the summary provided above.

#### Objections to the Drawings

The Office Action objects to the drawings for failing “to show the subject matter, as set forth in claims 15, 34-36 as described in the specification.”

Figures 8a and 8b have been amended to include perforations 249 whose description may be found on page 32, lines 9-13 of the specification.

The drawings are now believed to be in accordance with 37 CFR 1.83(a). Accordingly, withdrawal of this objection is respectfully requested.

#### Objections to the Specification

The Office Action objects to the specification for failing to provide proper antecedent basis for the claimed subject matter set forth in claims 15 and 34-36. Applicants respectfully disagree.

Claim 15 is directed towards a method for monitoring material properties. The method comprises mounting an electromagnetic sensor with perforations on a test material surface (page 8, lines 21-23 and page 32, lines 9-13), the sensor having conducting segments (page 28, line 28 - page 29, line 6) and being responsive to an electrical property of the material area under the

sensor (page 8, line 15-18), the perforations in the sensor allowing corrosion to occur at the test material surface (page 32, lines 9-13), driving the conducting segments with an electrical signal to measure a sensor response (page 16, lines 3-4), and converting the sensor response into at least one electrical property of the material under the sensor (page 17, lines 4-14).

Claim 34 is directed towards a method for monitoring material properties. The material properties comprising mounting an electromagnetic sensor on a test material surface to be exposed to environmental conditions (page 32, lines 9-13), the sensor having conducting segments (page 28, line 28 - page 29, line 6) and being responsive to an electrical property of the material area under the sensor (page 8, line 15-18), driving the conducting segments with an electrical signal to measure a sensor response (page 16, lines 3-4), and converting the sensor response into at least one electrical property of the material under the sensor (page 17, lines 4-14).

Claim 35 is directed to a method as claimed in claim 34, wherein the electromagnetic sensor is perforated (page 32, lines 9-13).

Claim 36 is directed to a method as claimed in claim 34, wherein the environmental exposure causes corrosion of the test material surface (page 32, lines 9-13).

Accordingly, withdrawal of this objection is respectfully requested.

Rejections under 35 U.S.C § 112, First Paragraph

The Office Action rejects claims 15 and 34-36 under 35 U.S.C § 112, first paragraph, as failing to comply with the written description requirement.

As should be appreciated from the discussion above with regards to claims 15 and 34-36, support for the mentioned claims may be found in the specification.

Accordingly, withdrawal of this rejection is respectfully requested.

Rejections under 35 U.S.C § 112, Second Paragraph

The Office Action rejects claims 15 and 34-36 under 35 U.S.C § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter.

The Office Action has stated it is unclear as to what the driving segments are. Claims 15 and 34 have been amended to recite “driving the conducting segments,” thus referring to the previously recited conducting segments.

The Office Action has stated it is unclear as to how the perforations in the sensor allow corrosion to occur at the test material surface. Applicants respectfully assert that the specification on page 32, lines 9-13, as well as the amendment to Figures 8a and 8b, clearly describe how the perforations in the sensor allow corrosion to occur at the test material surface.

The Office Action has also asserted the phrase “a sensor response” should be “the sensor response.” Applicants respectfully disagree and assert the claims as presented are in compliance with 35 U.S.C § 112, second paragraph. The article “a” is used at the first occurrence of “sensor response” consistent with standard claim drafting practice.

Accordingly, withdrawal of these rejections is respectfully requested.

### CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By   
James M. Smith  
Registration No. 28,043  
Telephone: (978) 341-0036  
Facsimile: (978) 341-0136

Concord, MA 01742-9133

Dated: 9/30/15

9/64

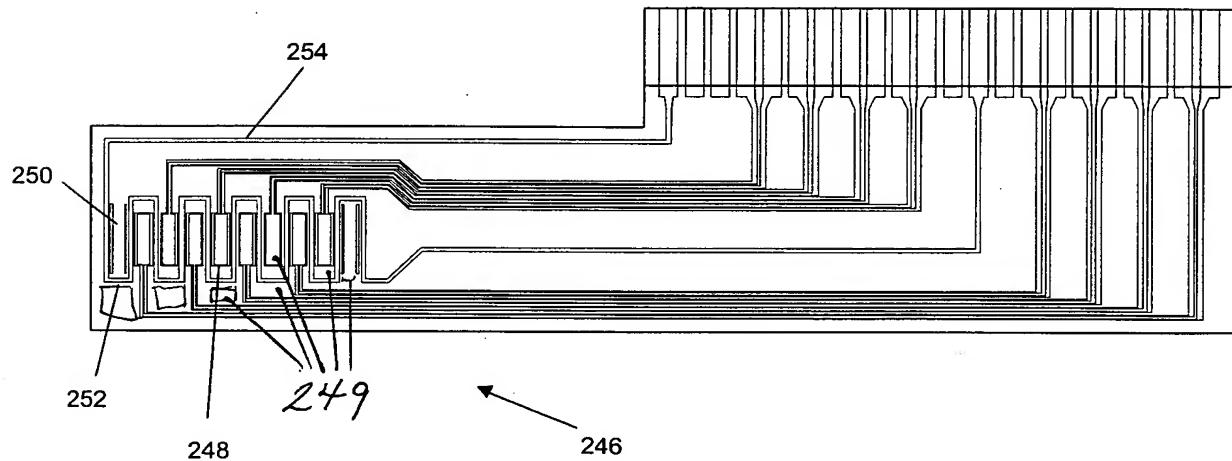


FIG. 8a

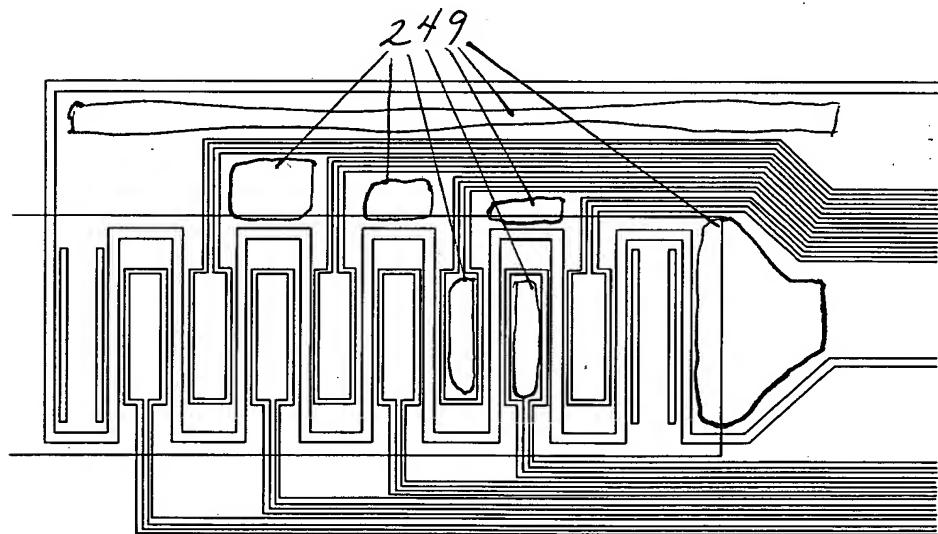


FIG. 8b